**Genetics & Heredity Review Guide**

**Be able to define and explain the following terms:**

Genetics Heredity Inheritance

Trait Chromosome DNA

Gene Dominant Gene Recessive Gene

Incomplete Dominance Alleles Genotype

Phenotype Punnett Square Probability

Homozygous Heterozygous Cross-Pollination

Self-Pollination True-Breeding (Purebred) Hybrid

**Punnett Squares:**

* Be able to create/make a Punnett Square
* Be able to complete or fill in a Punnett Square
* Be able to analyze and interpret a Punnett Square

**Compare & Contrast Asexual/Sexual Reproduction:**

* Number of organisms involved
* How the cells divide
* Types of asexual reproduction
* Advantages of each
* Disadvantages of each
* How it helps the species evolve
* Involvement of sex cells
* Examples

**Compare & Contrast Mitosis & Meiosis:**

* Purpose
* Types of Cells
* # of daughter cells
* Genes
* Uses in Humans
* Way to remember

**Pedigree Chart:**

* Explain what a pedigree chart is used for
* Know what symbols represent males and females
* Know what symbols represent carriers of a trait
* Know what symbols represent people who have the trait

**Summary of Topics (this is just a summary, make sure to study all of your notes)**

• Heredity is the passing of traits from parents to offspring.

• Gregor Mendel made carefully planned experiments using pea plants that could self-pollinate.

• When parents with different traits are bred, dominant traits are always present in the first generation. Recessive traits are not visible in the first generation but reappear in the second generation.

• Mendel found a 3:1 ratio of dominant-to-recessive traits in the second generation.

• Instructions for an inherited trait are called genes. For each gene, there are two alleles, one inherited from each parent. Both alleles make up an organism’s genotype. Phenotype is an organism’s appearance.

• Punnett squares show all possible offspring genotypes.

• Probability can be used to describe possible outcomes in offspring and the likelihood of each outcome.

• Incomplete dominance occurs when one allele is not completely dominant over the other allele.

• Some genes influence more than one trait.

• In mitosis, chromosomes are copied once, and then the nucleus divides once. In meiosis, chromosomes are copied once, and then the nucleus divides twice.

• The process of meiosis produces sex cells, which have half the number of chromosomes. These two halves combine during reproduction.

• In humans, females have two X chromosomes. So, each egg contains one X chromosome. Males have both an X and a Y chromosome. So, each sperm cell contains either an X or a Y chromosome.

• Sex-linked disorders occur in males more often than in females. Color blindness and hemophilia are examples of sex-linked disorders.

• A pedigree is a diagram used to trace a trait through many generations of a family.